P.O. Box 515429
Dallas, Texas 75075
Ph: (972) 669-3390
Fax: (469) 241-0896
Email: oseicorp@msn.com
Web: www.osei.us

EMULATING MOTHER NATURE

HOW BIOREMEDIATION OCCURS IN MOTHER NATURE

We would like to first explain what happens In Mother Nature when a hazardous material is spilled.

There is a myriad of bacteria everywhere, where the spill comes in direct contact with bacteria; that bacteria is killed or dies off. The bacteria that is proximal to the spill but not in direct contact, reacts in several ways.

First, the bacteria separate themselves far enough away so as to protect themselves from the toxicity of the spill.

Second, the bacteria then releases enzymes and bio surfactants to attack the spill.

Third, the bio surfactants emulsify and solubilize the spill. What this means IS the bio surfactants will break up the spill and partition the spill into a manageable consistency. This is also breaking down the molecular structure of the spill or detoxifying it, so it can be used as a food source.

The enzymes then form binding sites on the emulsified or solubilized spill and this is where the bacteria will initially attach themselves and start the digestive process. For this process to occur there has to be large amounts of bacteria, and it is a long process for bacteria to acclimate themselves to a spill. Then it takes time for the bacteria to release enzymes and surfactants. One of the limiting factors is the number of bacteria present to produce, and release enough enzymes and surfactants to get the process started. This is why you hear scientists talk about adding nutrients to jumpstart the rapid growth of bacteria so enough enzymes and bio surfactants can be released to affect the mitigation of the spill.

However, nutrients alone are limited because of concentration (washed away or diluted) and the time it takes to grow a large population of bacteria. Wouldn't it be nice if there was a means of emulating Mother Nature and at the same time speeding up the process to mitigate in hours or days what Mother Nature takes days, months and years to handle on her own?

P2 Emulating Mother Nature continued

OIL SPILL EATER II

OIL SPILL EATER II (OSE II) contains the enzymes, bio surfactants, nutrients and other necessary constituents for *complete life cycles and biodegradation*. When OSE II is added to a spill, it is not necessary to wait on the proximal bacteria to release enough enzymes or bio surfactants since they are already supplied in our product. Therefore, the minute you apply OSE II, there is enough bio surfactant to start the emulsification and solubilization process. This process generally takes a few minutes to several minutes, depending on the consistency of the spill. As the bio surfactants do their job, the enzymes are attaching themselves to broken down hydrocarbon structures, forming digestive binding sites.

Note: Once this process has occurred, several things are true:

1. The fire hazard has diminished.

2. The toxicity of the spill is rapidly diminished.

3. The odor or smell is almost non-existent.

4. The oil or spill will no longer adhere to anything.

5. The spill is caused to float, OSE II will prevent the oil from sinking.

If the spill has not reached a shoreline yet, but does so after application, it will not adhere to sand, rock, wood, metal or any vegetation.
If the spill has already attached itself, once application occurs, the spill will be lifted from sand, rock, wood, metal or vegetation.
The spill is detoxified to the point, that indigenous (natural) bacteria can now utilize the oil as a food source. This also diminishes toxicity to marine organisms, birds or wildlife.

OSE II causes the oil to float on the surface of the water, which reduces the impact to the sub-surface - preventing secondary contamination of the water column or tertiary contamination on the floor of the body of water associated with the spill area. The spill being held on the surface will make it easy to monitor.

OSE II also has an extremely efficient nutrient system that is activated once you mix OSE II with natural water. While the spill is being broken down, detoxified the indigenous bacteria in the natural water used to mix OSE II starts rapidly colonizing or proliferating the growth of large numbers of indigenous bacteria. Once the bacteria run out of the OSE II readily available nutrients they convert over to the only food source left the detoxified spill. The spill is then digested to CO2 and water. In some cases you can see bacteria growing on the spill, and the oil will be digested to CO2 and water before your eyes on a contained spill. In laboratory test once you see the water in the test beaker or aquarium become turbid, you know it is only a matter of time before the contaminant is remediated to CO2 and water.

Unlike mechanical cleanup, which cleans up a maximum of 20% of the oil spilled, OSE II will actually address 100% of a spill. This information is substantiated by the EPA's listing of OSE II on the National Contingency Plan for oil spills or the NCP list, which contains the efficacy test performed for the EPA at LSU University. You can see this information at www.osei.us, click in the icon that looks like a flower moving across the page. This will link you to the EPA's site with the OSE II listing, and information.

Oil Spill Eater II emulates (copies) mother nature's process exactly.